



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

DUQUESNE LIGHT COMPANY

OHIO EDISON COMPANY

PENNSYLVANIA POWER COMPANY

DOCKET NO. 50-334

BEAVER VALLEY POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 148  
License No. DPR-66

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Duquesne Light Company, et al. (the licensee) dated June 29, 1989, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-66 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 148, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective on issuance, to be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



John F. Stolz, Director  
Project Directorate I-4  
Division of Reactor Projects - 1/11  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: January 3, 1990

ATTACHMENT TO LICENSE AMENDMENT NO. 148

FACILITY OPERATING LICENSE NO. DPR-66

DOCKET NO. 50-334

Replace the following pages of Appendix A (Technical Specifications) with the enclosed pages as indicated. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

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REACTIVITY CONTROL SYSTEMS  
CHARGING PUMP - SHUTDOWN  
LIMITING CONDITION FOR OPERATION

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3.1.2.3 One charging pump in the boron injection flow path required by Specification (3.1.2.1) or Low Head Safety Injection Pump (with an open reactor coolant system vent of greater than or equal to 3.14 square inches) shall be OPERABLE and capable of being powered from an OPERABLE bus.

APPLICABILITY: MODES 5 and 6.

ACTION:

With none of the charging pumps OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes until one charging pump or Low Head Safety Injection pump is restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

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4.1.2.3.1 The above required charging pump shall be demonstrated OPERABLE by verifying, on recirculation flow, that the pump develops a discharge pressure greater than or equal to 2402 psig when tested pursuant to Specification 4.0.5.

4.1.2.3.2 All charging pumps, except the above required charging pump, shall be demonstrated inoperable\* at least once per 12 hours by verifying that the control switches are placed in the PULL-TO-LOCK position and tagged.

4.1.2.3.3 When the Low Head Safety Injection pump is used in lieu of a charging pump, the Low Head Safety Injection pump shall be demonstrated OPERABLE by:

- a. Verification of an operable RWST pursuant to 4.1.2.7,
- b. Verification of an operable Low Head Safety Injection Pump pursuant to Specification 4.5.2.b.2,
- c. Verification of an operable Low Head Safety Injection flow path from the RWST to the Reactor Coolant System once per shift, and
- d. Verification that the vent is open at least once per 12 hours.\*\*

\* An inoperable pump may be energized for testing provided the discharge of the pump has been isolated from the RCS by a closed isolation valve with power removed from the valve operator, or by a manual isolation valve locked in the closed position.

\*\* Except when the vent path is provided with a valve which is locked or provided with remote position indication, or sealed, or otherwise secured in the open position, then verify these valves open at least once per 7 days.



TABLE 4.3-6

REMOTE SHUTDOWN MONITORING INSTRUMENTATION  
SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>
1. Intermediate Range Nuclear Flux	M	N.A.
2. Intermediate Range Startup Rate	M	N.A.
3. Source Range Nuclear Flux (1)	M (4)	N.A.
4. Source Range Startup Rate (1)	M (4)	N.A.
5. Reactor Coolant Temperature - Hot Leg	M	R
6. Reactor Coolant Temperature - Cold Leg	M	R
7. Pressurizer Pressure	M	R
8. Pressurizer Level	M	R
9. Steam Generator Pressure	M	R
10. Steam Generator Level	M	R
11. RHR Temperature - HX Outlet (3)	M (5)	R
12. Auxiliary Feedwater Flow Rate	S/U (2)	R

Notation

- (1) Operability required in accordance with Specification 3.3.1.1.
- (2) Channel check to be performed in conjunction with Surveillance Requirement 4.7.1.2.c following an extended plant outage.
- (3) Operability required in accordance with Specification 3.4.1.3.
- (4) Below P-6.
- (5) Channel check to be performed in conjunction with Surveillance Requirement 4.4.1.3.1.

TABLE 4.3-7

ACCIDENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>
1. Pressurizer Water Level	M	R
2. Auxiliary Feedwater Flow Rate	S/U (1)	R
3. Reactor Coolant System Subcooling Margin	M	R
4. PORV Acoustical Detector Position Indicator	M	R
5. PORV Limit Switch Position Indicator	M	R
6. PORV Block Valve Limit Switch Position Indicator	M	R
7. Safety Valve Acoustical Detector Position Indicator	M	R
8. Safety Valve Temperature Detector Position Indicator	M	R
9. PORV Control Pressure Channels (PT-RC-444, 445)	M	R
10. Containment Sump Wide-Range Water Level	M	R
11. Containment Wide-Range Pressure	N/A	R
12. In-Core Thermocouples (Core-Exit Thermocouples)	M	R
13. Reactor Vessel Level Indicating System	M	R

(1) Channel check to be performed in conjunction with Surveillance Requirement 4.7.1.2.c following an extended plant outage.

TABLE 3.3-13 (Continued)

ACTION STATEMENTS

- ACTION 31 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, operation of this system may continue provided grab samples are taken and analyzed at least once per 24 hours. With both channels inoperable, operation may continue provided grab samples are taken and analyzed at least once per 4 hours during degassing operations and at least once per 24 hours during other operations.
- ACTION 32 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue provided samples are continuously collected with auxiliary sampling equipment as required in Table 4.11-2 or sampled and analyzed once every 8 hours.

## EMERGENCY CORE COOLING SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

- b. At least once per 31 days and within 6 hours after each solution volume increase of greater than or equal to 1% of tank volume by verifying the boron concentration of the accumulator solution.
- c. At least once per 31 days when the RCS pressure is above 2000 psig be verifying that power to the isolation valve operator control circuit is disconnected by removal of the plug in the lock out jack from the circuit.
- d. Verifying at least once per 18 months that each accumulator isolation valve opens automatically under each of the following conditions:
  - 1. When the RCS pressure exceeds 2000 psig.
  - 2. Upon receipt of a Safety Injection test signal.

4.5.1.2 Each accumulator water level and pressure alarm channel shall be demonstrated OPERABLE:

- a. At least once per 31 days by the performance of a CHANNEL FUNCTIONAL TEST.
- b. At least once per 18 months by the performance of a CHANNEL CALIBRATION.

4.5.1.3 During normal plant cooldown and depressurization, each accumulator discharge isolation valve [MOV-1SI-865A, B and C] shall be verified to be closed\* and de-energized when RCS pressure is reduced to  $1,000 \pm 100$  psig.

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\* With the accumulator pressure less than the low temperature overpressure protection setpoint the accumulator discharge isolation valves may be opened to perform accumulator discharge check valve testing.



### 3/4.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

#### BASES

##### 3/4.5.1 ACCUMULATORS

The OPERABILITY of each of the RCS accumulators ensures that a sufficient volume of borated water will be immediately forced into the reactor core through each of the cold legs in the event the RCS pressure falls below the pressure of the accumulators. This initial surge of water into the core provides the initial cooling mechanism during large RCS pipe ruptures.

The limits on accumulator volume, boron concentration and pressure ensure that the assumptions used for accumulator injection in the accident analysis are met. The limit of one hour for operation with an inoperable accumulator minimizes the time exposure of the plant to a LOCA event occurring concurrent with failure of an additional accumulator which may result in unacceptable peak cladding temperatures.

The RCS accumulators are isolated when RCS pressure is reduced to  $1000 \pm 100$  psig to prevent borated water from being injected into the RCS during normal plant cooldown and depressurization conditions and also to prevent inadvertent overpressurization of the RCS at reduced RCS temperature. With the accumulator pressure reduced to less than the reactor vessel low temperature overpressure protection setpoint, the accumulator pressure cannot challenge the cold overpressure protection system or exceed the 10 CFR 50 Appendix G limits. Therefore, the accumulator discharge isolation valves may be opened to perform the accumulator discharge check valve testing specified in the IST program.

##### 3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS

The OPERABILITY of two separate and independent ECCS subsystems ensures that sufficient emergency core cooling capability will be available in the event of a LOCA assuming the loss of one subsystem through any single failure consideration. Either subsystem operating in conjunction with the accumulators is capable of supplying sufficient core cooling to limit the peak cladding temperatures within acceptable limits for all postulated break sizes ranging from the double-ended break of the largest RCS cold leg pipe downward. In addition, each ECCS subsystem provides long-term core cooling capability in the recirculation mode during the accident recovery period.

The Surveillance Requirements provided to ensure OPERABILITY of each component ensure that at a minimum, the assumptions used in the accident analyses are met and that subsystem OPERABILITY is maintained.

The limitation for a maximum of one charging pump to be OPERABLE and the Surveillance Requirement to verify all charging pumps except the required OPERABLE pump to be inoperable below 275°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

##### 3/4.5.4 BORON INJECTION SYSTEM

The OPERABILITY of the boron injection system as part of the ECCS ensures that sufficient negative reactivity is injected into the core to limit any positive increase in reactivity caused by RCS system cooldown. RCS cooldown can be caused by inadvertent depressurization, a loss-of-coolant accident or a steam line rupture.

The boron injection tank is required to be isolated when RCS temperature is less than 275°F to prevent a potential overpressurization due to an inadvertent safety injection signal.

CONTAINMENT SYSTEMS

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

CONTAINMENT QUENCH SPRAY SYSTEM

LIMITING CONDITION FOR OPERATION

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3.6.2.1 Two separate and independent containment quench spray subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one containment quench spray subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

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4.6.2.1 Each containment quench spray subsystem shall be demonstrated OPERABLE;

a. At least once per 31 days by:

1. Verifying that each valve (manual, power-operated, or automatic) in the flow path not locked, sealed, or otherwise secured in position, is in its correct position; and
2. Verifying the temperature of the borated water in the refueling water storage tank is within the limits of Specification 3.1.2.8.b.3.

b. By verifying, that on a recirculation flow, each pump develops a differential pressure of greater than or equal to 142 psid at a flow of  $\geq 1600$  gpm when tested pursuant to Specification 4.0.5.

PLANT SYSTEMS  
MAIN STEAM LINE ISOLATION VALVES  
LIMITING CONDITION FOR OPERATION

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3.7.1.5 Each main steam line isolation valve shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

MODES 1 - With one main steam line isolation valve inoperable but open, POWER OPERATION may continue provided the inoperable valve is restored to OPERABLE status within 4 hours;

Otherwise, be in HOT SHUTDOWN within the next 12 hours.

MODES 2 - With one main steam line isolation valve inoperable,  
and 3 subsequent operation in MODES 2 or 3 may proceed after:

a. The inoperable isolation valve is restored to OPERABLE status, or

b. The isolation valve is maintained closed;

Otherwise, be in HOT SHUTDOWN within the next 12 hours.

SURVEILLANCE REQUIREMENTS

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4.7.1.5 Each main steam line isolation valve that is open shall be demonstrated OPERABLE by:

- a. Part-stroke exercising the valve at least once per 92 days, and
- b. Verifying full closure within 5 seconds on any closure actuation signal while in HOT STANDBY with  $T_{avg} \geq 515^{\circ}\text{F}$  during each reactor shutdown except that verification of full closure within 5 seconds need not be determined more often than once per 92 days.



REFUELING OPERATION

3/4 9.8 RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION

LIMITING CONDITION FOR OPERATION

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3.9.8.1 At least one residual heat removal (RHR) loop shall be in operation.

APPLICABILITY: MODE 6

ACTION:

- a. With less than one residual heat removal loop in operation, except as provided below, suspend all operations involving an increase in the reactor decay heat load or a reduction in boron concentration of the Reactor Coolant System. Close all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere within 4 hours.
- b. The residual heat removal loop may be removed from operation for up to 1 hour per 8 hour period during the performance of CORE ALTERATIONS in the vicinity of the reactor pressure vessel (hot) legs.
- c. The residual heat removal loop may be removed from operation for up to 4 hours per 8 hour period during the performance of Ultrasonic In-service Inspection inside the reactor vessel nozzles provided there is at least 23 feet of water above the top of the reactor vessel flange.
- d. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

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4.9.8.1 Verify at least one residual heat removal loop is in operation and circulating reactor coolant at:

- a. A flow rate  $\geq$  1000 gpm twice per shift when the Reactor Coolant System is in a reduced inventory condition\*.
- b. A flow rate  $\geq$  3000 gpm prior to the start of and once per hour during a reduction in the Reactor Coolant System boron concentration.

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\* The Reactor Coolant System water level is lower than three feet below the reactor vessel flange.





UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

DUQUESNE LIGHT COMPANY

OHIO EDISON COMPANY

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

THE TOLEDO EDISON COMPANY

DOCKET NO. 50-412

BEAVER VALLEY POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 25  
License No. NPF-73

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Duquesne Light Company, et al. (the licensee) dated June 29, 1989, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

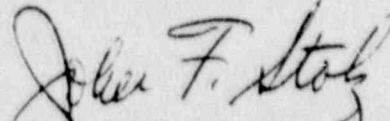
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-73 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 25, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated in the license. DCLCo shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective on issuance, to be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



John F. Stolz, Director  
Project Directorate I-4  
Division of Reactor Projects I/II  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: January 3, 1990

ATTACHMENT TO LICENSE AMENDMENT NO. 25

FACILITY OPERATING LICENSE NO. NPF-73

DOCKET NO. 50-412

Replace the following pages of Appendix A (Technical Specifications) with the enclosed pages as indicated. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

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## REACTIVITY CONTROL SYSTEMS

### CHARGING PUMP-SHUTDOWN

#### LIMITING CONDITION FOR OPERATION

3.1.2.3 One charging pump in the boron injection flow path required by Specification 3.1.2.1 or Low Head Safety Injection Pump (with an open Reactor Coolant System vent of greater than or equal to 3.14 square inches) shall be OPERABLE and capable of being powered from an OPERABLE emergency bus.

APPLICABILITY: MODES 4, 5 and 6

#### ACTION:

With none of the above pumps OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes until one charging pump or Low Head Safety Injection pump is restored to OPERABLE status.

#### SURVEILLANCE REQUIREMENTS

4.1.2.3.1 The above required charging pump shall be demonstrated OPERABLE by verifying, that on recirculation flow, the pump develops a differential pressure of  $\geq 2437$  psid when tested pursuant to Specification 4.0.5.

4.1.2.3.2 All charging pumps, except the above required charging pump, shall be demonstrated inoperable\* by verifying that the control switches are placed in the PULL-TO-LOCK position and tagged within 4 hours after entering MODE 4 from MODE 3 or prior to the temperature of one or more of the RCS cold legs decreasing below 325°F, whichever comes first, and at least once per 12 hours thereafter.

4.1.2.3.3 When the Low Head Safety Injection pump is used in lieu of a charging pump, the Low Head Safety Injection pump shall be demonstrated OPERABLE by:

- a. Verification of an OPERABLE RWST pursuant to 4.1.2.7 and 4.1.2.8
- b. Verification of an OPERABLE Low Head Safety Injection Pump pursuant to Specification 4.5.2.b.2,
- c. Verification of an OPERABLE Low Head Safety Injection flow path from the RWST to the Reactor Coolant System once per shift, and
- d. Verification that the vent is open at least once per 12 hours.\*\*

\*An inoperable pump may be energized for testing provided the discharge of the pump has been isolated from the RCS by a closed isolation valve with power removed from the valve operator, or by a manual isolation valve locked in the closed position.

\*\*Except when the vent path is provided with a valve which is locked or provided with remote position indication, or sealed, or otherwise secured in the open position, then verify these valves open at least once per 7 days.



## INSTRUMENTATION

### ACCIDENT MONITORING INSTRUMENTATION

#### LIMITING CONDITION FOR OPERATION

3.3.3.8 The accident monitoring instrumentation channels shown in Table 3.3.11 shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3.

#### ACTION

- a. With the number of OPERABLE accident monitoring instrumentation channels less than the Total Number of Channels shown in Table 3.3.11, either restore the inoperable channel(s) to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours except for the PORV(s) which may be isolated in accordance with Specification 3.4.11.
- b. With the number of OPERABLE accident monitoring instrumentation channels less than the Minimum Channels OPERABLE requirements of Table 3.3.11, either restore the inoperable channel(s) to OPERABLE status within 48 hours or be in at least HOT SHUTDOWN within the next 12 hours.
- c. With the number of OPERABLE Reactor Vessel Level Indication System channels less than the required number of channels or the Minimum Channels OPERABLE requirement, restore the inoperable channel(s) to OPERABLE status as per ACTION a or b above as applicable if repair is not feasible, prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 14 days that provides action taken, cause of the inoperability, and the plans and schedule for restoring the channels to OPERABLE status. This ACTION statement applies to the first fuel cycle only.
- d. With the number of OPERABLE Reactor Coolant System Subcooling Margin Monitor instrumentation channels less than the Minimum Channels OPERABLE requirements of Table 3.3.11, either restore the inoperable channel(s) to OPERABLE status within 7 days or be in a least HOT SHUTDOWN within the next 12 hours.
- e. The provisions of Specification 3.0.4 are not applicable.

#### SURVEILLANCE REQUIREMENTS

4.3.3.8 Each accident monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK and CHANNEL CALIBRATION operations at the frequencies shown in Table 4.3-7.

TABLE 3.3-13 (Continued)

ACTION STATEMENTS

- ACTION 27 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, the contents of the tank may be released to the environment provided that prior to initiating the release:
1. At least two independent samples of the tank's content are analyzed, and at least two technically qualified members of the Facility Staff independently verify the release rate calculations and discharge valve lineup, or
  2. Initiate continuous monitoring with a comparable alternate monitoring channel. Surveillance requirements applicable to the inoperable channel shall apply to the comparable alternate monitoring channel when used to satisfy this technical specification requirement.
- Otherwise, suspend releases of radioactive effluents via this pathway.
- ACTION 28 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue provided the flow rate is estimated at least once per 4 hours.
- ACTION 29 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue provided:
1. Grab samples are taken at least once per 8 hours and these samples are analyzed for gross activity within 24 hours, or
  2. Initiate continuous monitoring with a comparable alternate monitoring channel. Surveillance requirements applicable to the inoperable channel shall apply to the comparable alternate monitoring channel when used to satisfy this technical specification requirement.
- ACTION 30 - With the number of channels OPERABLE less than required by Minimum Channels OPERABLE requirement, immediately suspend PURGING of Reactor Containment via this pathway.
- ACTION 31 - With the number of channels OPERABLE one less than required by the MINIMUM Channels OPERABLE requirement, operation of this system may continue provided grab samples are taken and analyzed at least once per 24 hours. With both channels inoperable, operation may continue provided grab samples are taken and analyzed at least once per 4 hours during degassing operations and at least once per 24 hours during other operations.
- ACTION 32 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue provided samples are continuously collected with auxiliary sampling equipment as required in Table 4.11-2 or sampled and analyzed once every 8 hours.
- ACTION 35 - (This ACTION is not used)

## EMERGENCY CORE COOLING SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

- c. At least once per 31 days when the RCS pressure is above 1000 psig by verifying that power to the isolation valve operator control circuit is disconnected by removal of the plug in the lock out jack from the circuit.
  - d. At least once per 18 months by verifying that each accumulator isolation valve opens automatically under each of the following conditions:
    - 1) When an actual or a simulated RCS pressure signal exceeds the P-11 (Pressurizer Pressure Block of Safety Injection) Setpoint, and
    - 2) Upon receipt of a Safety Injection test signal.
- 4.5.1.2 Each accumulator water level and pressure alarm channel shall be demonstrated OPERABLE:
- a. At least once per 31 days by the performance of a CHANNEL FUNCTIONAL TEST.
  - b. At least once per 18 months by the performance of a CHANNEL CALIBRATION.
- 4.5.1.3 During normal plant cooldown and depressurization, each accumulator discharge isolation valve 2 SIS-MOV 865 A, B and C shall be verified to be closed\* and de-energized when RCS pressure is reduced to  $1,000 \pm 100$  psig.

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\*With the accumulator pressure less than the low temperature overpressure protection setpoint the accumulator discharge isolation valves may be opened to perform accumulator discharge check valve testing.



## 3/4.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

### BASES

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#### 3/4.5.1 ACCUMULATORS

The OPERABILITY of each of the RCS accumulators ensures that a sufficient volume of borated water will be immediately forced into the reactor core through each of the cold legs in the event the RCS pressure falls below the pressure of the accumulators. This initial surge of water into the core provides the initial cooling mechanism during large RCS pipe ruptures.

The limits on accumulator volume, boron concentration and pressure ensure that the assumptions used for accumulator injection in the accident analysis are met.

The limit of one hour for operation with an inoperable accumulator minimizes the time exposure of the plant to a LOCA event occurring concurrent with failure of an additional accumulator which may result in unacceptable peak cladding temperatures.

The RCS accumulators are isolated when RCS pressure is reduced to  $1000 \pm 100$  psig to prevent borated water from being injected into the RCS during normal plant cooldown and depressurization conditions and also to prevent inadvertent overpressurization of the RCS at reduced RCS temperature. With the accumulator pressure reduced to less than the reactor vessel low temperature overpressure protection setpoint, the accumulator pressure cannot challenge the cold overpressure protection system or exceed the 10 CFR 50 Appendix G limits. Therefore, the accumulator discharge isolation valves may be opened to perform the accumulator discharge check valve testing specified in the IST program.

#### 3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS

The OPERABILITY of two separate and independent ECCS subsystems ensures that sufficient emergency core cooling capability will be available in the event of a LOCA assuming the loss of one subsystem through any single failure consideration. Either subsystem operating in conjunction with the accumulators is capable of supplying sufficient core cooling to limit the peak cladding temperatures within acceptable limits for all postulated break sizes ranging from the double ended break of the largest RCS cold leg pipe downward. In addition, each ECCS subsystem provides long term core cooling capability in the recirculation mode during the accident recovery period.

The surveillance requirements provided to ensure OPERABILITY of each component ensure that at a minimum, the assumptions used in the accident analyses are met and that subsystem OPERABILITY is maintained.

The limitation for a maximum of one charging pump to be OPERABLE and the surveillance requirement to verify all charging pumps except the required OPERABLE pump to be inoperable below 350°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.



## REFUELING OPERATIONS

### 3/4 9.8 RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION

#### LIMITING CONDITION FOR OPERATION

3.9.8.1 At least one residual heat removal (RHR) loop shall be OPERABLE and in operation.\*

APPLICABILITY: MODE 6.

#### ACTION:

- a. With less than one residual heat removal loop in operation, except as provided below, suspend all operations involving an increase in the reactor decay heat load or a reduction in boron concentration of the Reactor Coolant System. Close all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere within 4 hours.
- b. The residual heat removal loop may be removed from operation for up to 1 hour per 8 hour period during the performance of CORE ALTERATIONS in the vicinity of the reactor pressure vessel hot legs.
- c. The residual heat removal loop may be removed from operation for up to 4 hours per 8 hour period during the performance of Ultrasonic In-service Inspection inside the reactor vessel nozzles provided there is at least 23 feet of water above the top of the reactor vessel flange.
- d. The provisions of Specification 3.0.3 are not applicable.

#### SURVEILLANCE REQUIREMENTS

4.9.8.1 Verify at least one residual heat removal loop is in operation and circulating reactor coolant at:

- a. A flow rate  $\geq 1000$  gpm twice per shift when the Reactor Coolant System is in a reduced inventory condition\*.
- b. A flow rate  $\geq 3000$  gpm prior to the start of and once per hour during a reduction in the Reactor Coolant System boron concentration.

\*The reactor coolant system water level is lower than three feet below the reactor vessel flange.